



# FILTERS

Ceramic • SAW • Dielectric



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## Table of Contents

### Ceramic Filters

General Description .....	2-3
KBF - 450, 455 R/P/M Series Ceramic Filters .....	4-5
KBF - 450, 455 RS/PS Series Ceramic Filters .....	6-7

### SAW Filters

General Description .....	8-9
KAF - TV/VCR Series SAW Filters .....	10-11
KAF - Direct Broadcasting Series SAW Filters .....	12
KAF - Cordless Phones Series SAW Filters .....	13
KAF - CATV Converter Series SAW Filters .....	14

### Dielectric Filters

General Description .....	15
KDF - Series Dielectric Filters .....	16

# AVX/KYOCERA Ceramic Filters

## General Description

AVX/KYOCERA's sophisticated ceramics technology has greatly boosted selectivity and wide-band characteristics, and stabilized the characteristics of ceramic filters. The series covers a wide range of attenuation and band widths to allow selection of the most optimum filter characteristics for each application.

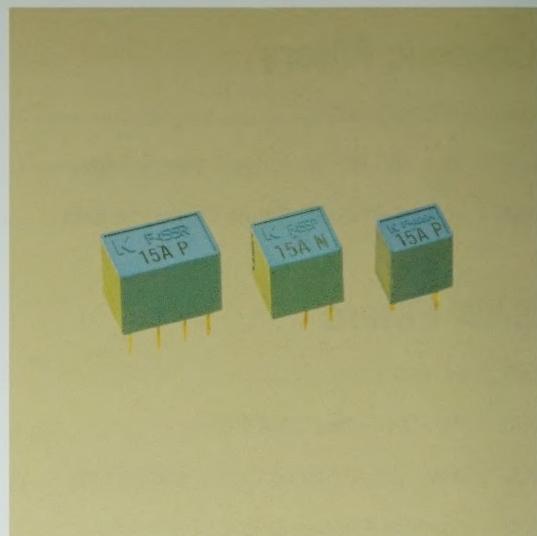
AVX/KYOCERA filters are bandpass filters consisting of one or more ceramic resonators connected in a ladder network configuration. Passband characteristics are determined by the relative resonance and anti-resonance frequencies of the resonators. Both narrow and wide passband configurations can be manufactured by adjusting the resonator frequency characteristics.

This is illustrated in (figure 1) for a single ladder. The difference between the resonance frequency of the series resonator and the anti-resonance frequency of the parallel resonator determines the band width of the ceramic filter (figure 2). Attenuation is determined by the ratio of the equivalent circuit parallel capacitors ( $C_p/C_s$ ) for the resonators. The higher capacitance value for the parallel resonator can be obtained by using a thinner dielectric than for the series resonator. This maintains relative tracking of capacitance values over the operating temperature range and assures excellent temperature characteristics for the ceramic filter.

Input and output impedance should be matched closely to the values listed for each ceramic filter. Incorrect impedance matching could result in shifts of the center frequency and increase ripple over those specified.

The terminology used to describe the performance of ceramic filters is illustrated in (figure 3.) All attenuation measurements are referenced to the insertion loss ratio of input and output. This will be between 4 and 6dB maximum. The passband width is measured at 6dB below the reference insertion loss level. For larger ladders, it is also defined at 40 or 50dB for 4 or 6 element filters respectively.

The frequency at the center of the passband width is called the center frequency. It may not be the frequency of



minimum loss. Variations in the passband region below the insertion loss level is called ripple and is expressed in dB's. The points of detuning (maximum attenuation) around the center frequency are called the stop band attenuation or selectivity. Spurious response is an expression relating to the minimum attenuation of unwanted frequencies in the stop band region referenced to the insertion loss or minimum attenuation in the passband range.

Group delay time is an expression for the distortion of linearity in the phase angle over the frequencies in the passband region. It is determined by the slope of the phase shift between input and output differentiated by the passband frequencies. Ceramic filters exhibit Gaussian filter type characteristics and special Group Delay control is available in 4-element AVX/KYOCERA filters.

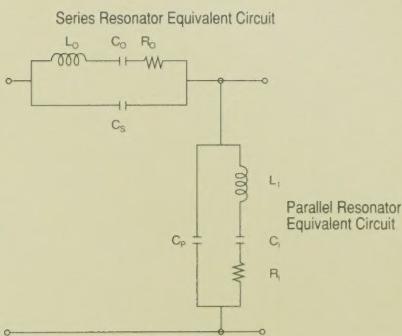


Fig. 1

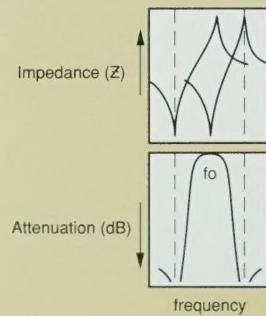


Fig. 2

# AVX/KYOCERA Ceramic Filters

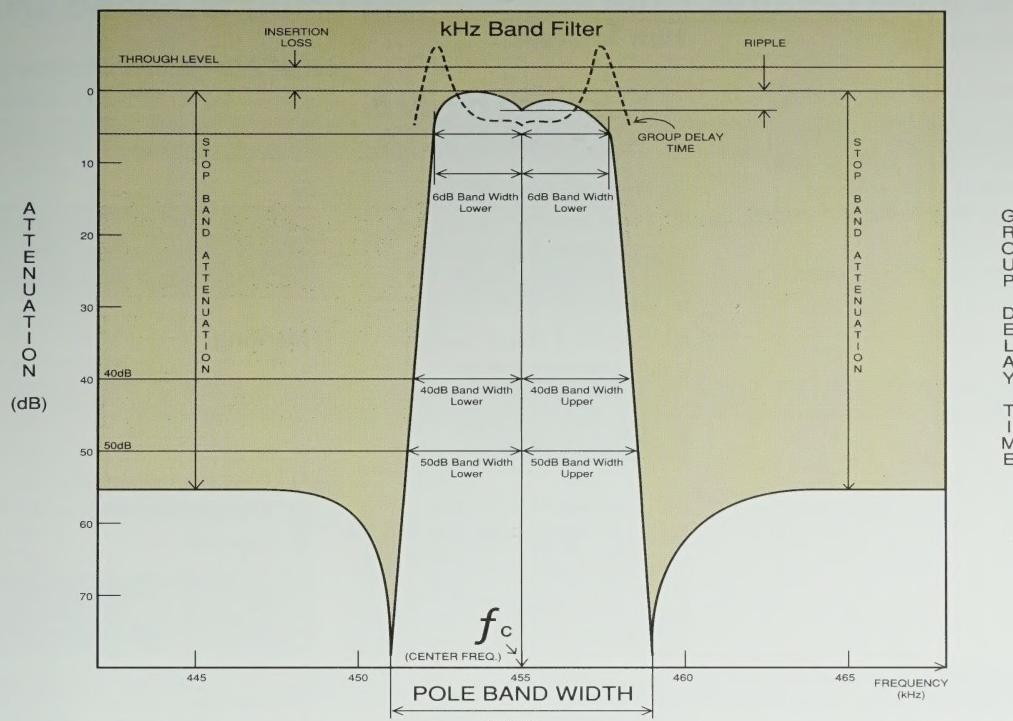


Fig. 3

The following is a check list of the information required for a custom design ceramic bulk filter:

<u>Performance Characteristics</u>	<u>Requested</u>	<u>AVX/KYOCERA Capability</u>
No. of Elements	_____	2, 4 or 6
Center Frequency	_____ KHz	450 to 460 KHz
Band Width at 6dB	_____ KHz	Min. 2,4, or 6 element
Band Width at 40dB	_____ KHz	4 elements only
Band Width at 50dB	_____ KHz	6 elements only
Insertion Loss	_____ dB	4 to 6dB max.
Ripple	_____ dB	2dB max.
Stop Band Attenuation	_____ dB	Min.
Group Delay Time	_____ $\mu$ s	

# KBF - 450, 455 R/P/M Series Ceramic Filters

## KHz Band Ceramic Filter

### Features:

- 1) Compact, with high selectivity
- 2) Low insertion loss
- 3) Adjustment-free
- 4) Wide choice of passband widths
- 5) Excellent shock resistance
- 6) Group delay control on 4 element.

### How To Order:

#### KBF - 455 R - 20 A

(1) (2) (3) (4) (5)

- (1) Model (Kyocera Bulk Filter)  
 (2) Center frequency

450	450KHz
455	455KHz

(5)

A	High selectivity type
AS	Ultra high selectivity Type
G	Group Delay Controlled Type

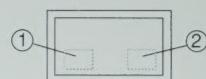
- (3) Number of ceramic elements

R	6-element
P	4-element
M	2-element

- (4) Pass band width (at 6dB)

# Elements	Total Band Width, KHz
6-element	20, 15, 12, 10, 9, 7, 6, 4
4-element	25, 20, 15, 10, 7, 6, 4
2-element	20, 15, 10, 6, 4

### Marking

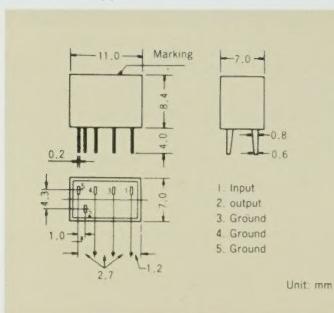


- (1) Passband width (at 6dB)  
 (2) Manufacturing monthly code  
 (3) Case color

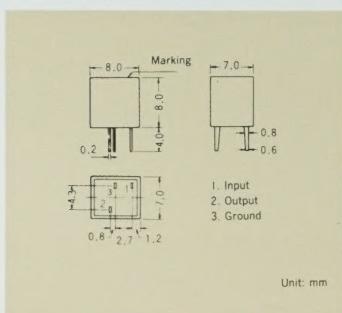
Blue	KBF-455M/P/R Series KBF-450R Series
Green	KBF-450P Series

### Dimensions:

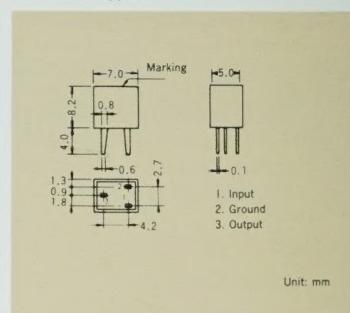
6-element type



4-element type

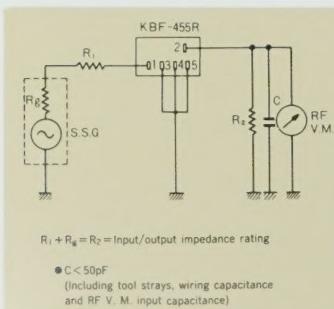


2-element type

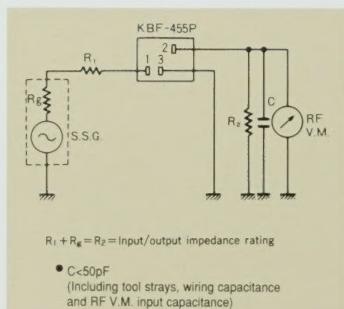


### Test Circuits:

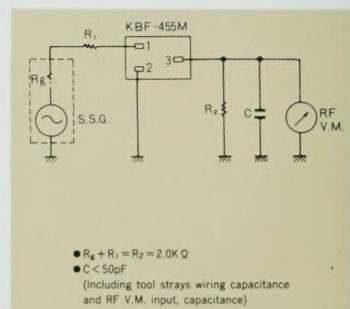
KBF-455R series (6-element)



KBF-455P series (4-element)



KBF-455M series (2-element)



# KBF - 450, 455 R/P/M Series Ceramic Filters

## KHz Band Ceramic Filter

### Specification (KBF-455 Series)

- 6-element type

Part No.	Center Frequency (fo)	Ripple	Bandwidth		Stop Band Attenuation	Insertion Loss	Input/output Impedance	Operating Temp. Range
			6dB	50dB				
KBF-455R-20A	455kHz±1.5kHz	2dB max.	±10KHz min.	±20KHz max.	37dB min.	4dB max.	1.5kΩ	-20°C to +80°C
KBF-455-15A			±7.5KHz min.	±15KHz max.		6dB max.	2.0Ω	
KBF-455R-10A			± 5.0 kHz min.	± 12kHz max.		55dB min.		
KBF-455R-7A			±3.5 KHz min.	±9KHz max.				
KBF-455R-4A	455kHz±1.0kHz	2dB max.	±2.0KHz min.	±7.5KHz max.				
KBF-455R-6AS			±3.0KHz min.	±9KHz max.				
KBF-455R-4AS			±2.0KHz min.	±7.5KHz max.				

- 4-element type

Part No.	Center Frequency (fo)	Ripple	Bandwidth		Stop Band Attenuation	Insertion Loss	Input/output Impedance	Operating Temp. Range
			6dB	40dB				
KBF-455P-25A	455kHz±2.0kHz	2dB max.	±12.5KHz min.	±24KHz max.	27dB min.	4dB max.	1.5Ω	-20°C to +80°C
KBF-455P-20A			±10.0KHz min.	±20KHz max.		6dB max.	2.0Ω	
KBF-455P-15A			±7.5KHz min.	±15KHz max.		35dB min.		
KBF-455P-10A			±5.0KHz min.	±11KHz max.				
KBF-455P-7A	455kHz±1.0kHz	2dB max.	±3.5KHz min.	±9KHz max.				
KBF-455P-4A			±2.0KHz min.	±7.5KHz max.				
KBF-455P-6AS			±3.0KHz min.	±9KHz max.				
KBF-455P-4AS			±2.0KHz min.	±7.5KHz max.				

- 2-element type

Part No.	Center Frequency (fo)	Ripple	Bandwidth		Stop Band Attenuation	Insertion Loss	Input/output Impedance	Operating Temp. Range
			6dB	Stop Band Width				
KBF-455M-20A	455kHz±2.0kHz	2dB max.	20KHz min.	45KHz max.	12dB min.	4dB max.	2.0kΩ	-20°C to +80°C
KBF-455M-15A			15KHz min.	35KHz max.		6dB max.		
KBF-455M-10A			10KHz min.	25KHz max.		11dB min.		
KBF-455M-6A			6KHz min.	20KHz max.				
KBF-455M-4A	455kHz±0.75kHz		4KHz min.	18KHz max.				

### Specification (KBF-450 Series)

- 6-element type

Part No.	Center Frequency (fo)	Ripple	Bandwidth		Stop Band Attenuation	Insertion Loss	Input/output Impedance	Operating Temp. Range
			6dB	50dB				
KBF-450R-20A	450kHz±1.5kHz	2dB max.	±10KHz min.	±20KHz max.	37dB min.	4dB max.	1.5kΩ	-20°C to +80°C
KBF-450R-15A			±7.5KHz min.	±15KHz max.		6dB max.	2.0kΩ	
KBF-450R-10A			± 5.0 kHz min.	± 12kHz max.		35dB min.		
KBF-450R-7A			±3.5 KHz min.	±9KHz max.				
KBF-450R-4A	450kHz±1.0kHz	2dB max.	±2.0KHz min.	±7.5KHz max.				
KBF-450R-6AS			±3.0KHz min.	±9KHz max.				
KBF-450R-4AS			±2.0KHz min.	±7.5KHz max.				

- 4-element type

Part No.	Center Frequency (fo)	Ripple	Bandwidth		Stop Band Attenuation	Insertion Loss	Input/output Impedance	Operating Temp. Range
			6dB	40dB				
KBF-450P-25A	450kHz±2.0kHz	2dB max.	±12.5KHz min.	±24KHz max.	27dB min.	4dB max.	1.5Ω	-20°C to +80°C
KBF-450P-20A			±10.0KHz min.	±20KHz max.		6dB max.	2.0Ω	
KBF-450P-15A			±7.5KHz min.	±15KHz max.		35dB min.		
KBF-450P-10A			±5.0KHz min.	±11KHz max.				
KBF-450P-7A	450kHz±1.0kHz	2dB max.	±3.5KHz min.	±9KHz max.				
KBF-450P-4A			±2.0KHz min.	±7.5KHz max.				
KBF-450P-6AS			±3.0KHz min.	±9KHz max.				
KBF-450P-4AS			±2.0KHz min.	±7.5KHz max.				

# KBF - 450, 455 RS/PS Series Ceramic Filters

## Low Profile KHz Band Ceramic Filters

### Features

- 1) Low Profile 4 and 6 elements only
- 2) Compact, high selectivity
- 3) Low insertion loss
- 4) Adjustment free
- 5) Wide choice of passband widths

### How to order:

#### **KBF - 455 RS - 20 A**

(1) (2) (3) (4) (5)

- (1) Model (Kyocera Bulk Filter)  
(2) Center frequency

450	450KHz
455	455KHz

(4) Passband width (at 6dB)

# Elements      Total Band Width, KHz

6-element	20, 15, 10, 7, 6, 4
4-element	25, 20, 15, 10, 7, 6, 4

- (3) Number of ceramic elements

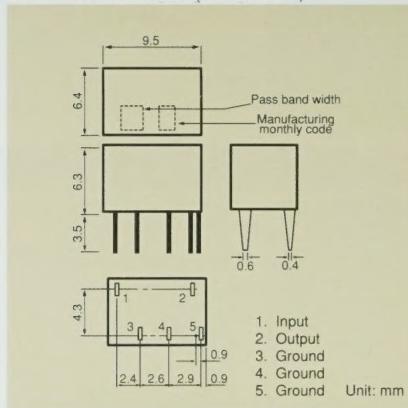
RS	6-element
PS	4-element

(5)

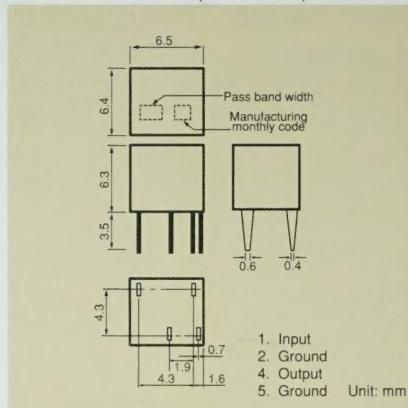
A      High selectivity type

### Dimensions

#### • KBF-455RS Series (6 Elements)

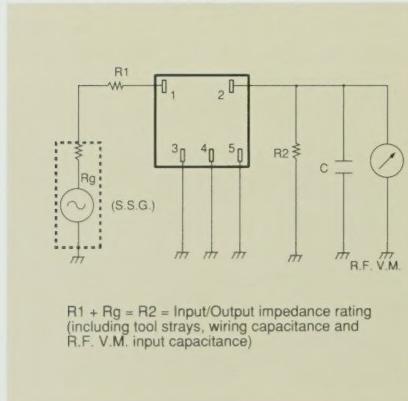


#### • KBS-455PS Series (4 Elements)

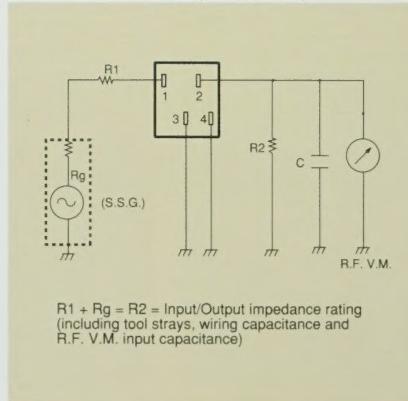


### Test Circuit

#### • KBF-455RS Series (6 Elements)



#### • KBF-455PS Series (4 Elements)



# KBF - 450, 455 RS/PS Series Ceramic Filters

## Low Profile KHz Band Ceramic Filters

### Specifications (KBF-455RS/PS Series)

- 6-element type

Model No.	Center Frequency ( $f_c$ )	Ripple	Bandwidth		Stop Band Attenuation	Insertion Loss	Input/Output Impedance	Operating Temp. Range
			6dB	50dB				
KBF-455RS-20A	455KHz±1.5KHz	2.0dB max.	±10KHz min.	±20KHz max.	37dB min.	4dB max.	1.5kΩ	-20°C to +80°C
KBF-455RS-15A			±7.5KHz min.	±15KHz max.		6dB max.		
KBF-455RS-9A			±4.5KHz min.	±10KHz max.		2.0kΩ		

- 4-element type

Model No.	Center Frequency ( $f_c$ )	Ripple	Bandwidth		Stop Band Attenuation	Insertion Loss	Input/Output Impedance	Operating Temp. Range
			6dB	50dB				
KBF-455PS-15A	455kHz±1.5kHz	2.0dB max.	±7.5KHz min.	±15KHz max.	27dB min.	6dB max.	1.5kΩ	-20°C to +85°C
KBF-455PS-12A			±6.0KHz min.	±12.5KHz max.		2.0kΩ		

### Specifications (KBF-450RS/PS Series)

- 6-element type

Model No.	Center Frequency ( $f_c$ )	Ripple	Bandwidth		Stop Band Attenuation	Insertion Loss	Input/Output Impedance	Operating Temp. Range
			6dB	50dB				
KBF-450RS-20A	450KHz±1.5KHz	2.0dB max.	±10KHz min.	±20KHz max.	37dB min.	4dB max.	1.5kΩ	-20°C to +80°C
KBF-450RS-15A			±7.5KHz min.	±15KHz max.		6dB max.		
KBF-450RS-9A			±4.5KHz min.	±10KHz max.		2.0kΩ		

- 4-element type

Model No.	Center Frequency ( $f_c$ )	Ripple	Bandwidth		Stop Band Attenuation	Insertion Loss	Input/Output Impedance	Operating Temp. Range
			6dB	50dB				
KBF-450PS-15A	450kHz±1.5kHz	2.0dB max.	±7.5KHz min.	±15KHz max.	27dB min.	6dB max.	1.5kΩ	-20°C to +80°C
KBF-450PS-12A			±6.0KHz min.	±12.5KHz max.		2.0kΩ		

# AVX/Kyocera Surface Acoustic Wave Filters

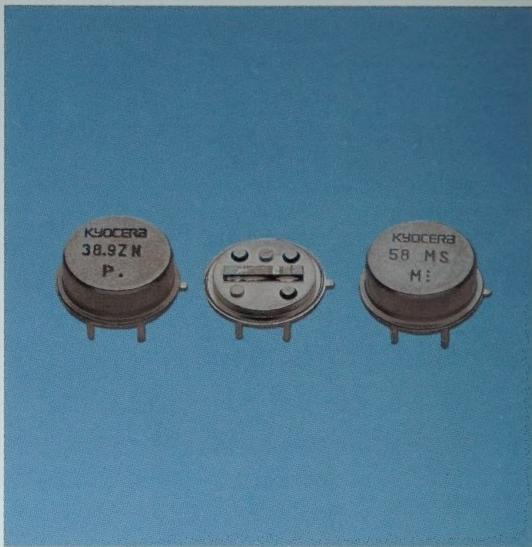
## General Description

Surface acoustic wave (SAW) filters are electroacoustic bandpass filters which operate via delay paths that add (passband) and cancel (stopband) frequencies. Surface waves are generated when RF signals are applied to electrodes on a piezoelectric substrate such as lithium niobate or PZT piezo ceramics. The amplitude and phase can be controlled by the distance between and overlap of the electrodes.

A typical SAW filter is shown in figure 1. Input is through the interdigital electrode transducer which generates a surface acoustic wave in the piezoelectric substrate. This wave travels to the output interdigital electrode transducer where it is reconverted to a voltage output. The direction of the wave is controlled by damping material which absorbs and prevents scattering of the wave.

SAW filters exhibit higher insertion loss than LC filters, 20-30 dB. Their prime feature is their flat passband characteristics (low ripple) coupled with a constant Group Delay Time (low distortion). This is obtained by the independent design perimeters for phase and amplitude characteristics. SAW filters are also small size, rugged, reliable and low cost.

AVX/KYOCERA SAW filters are available hermetically sealed in TO type cans to prevent moisture condensation on the surface of the device. They are available in the frequency range from 30 to 150 MHz and find wide application in TV, VCR, CATV, satellite receivers and cordless telephones.



# AVX/Kyocera Surface Acoustic Wave Filters

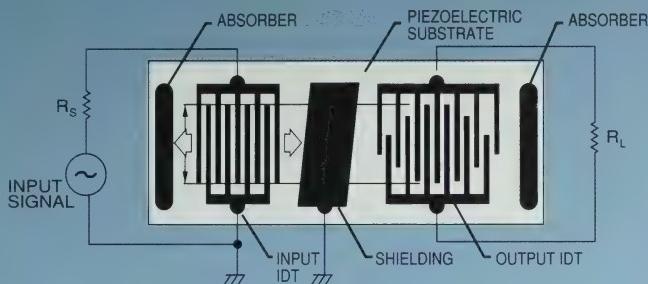


Figure 1

In order to design a SAW Filter for a customer frequency application, the following information is required:

Performance Characteristic	Request	Typical AVX/KYOCERA Capability
Center Frequency	MHz + _____ KHz	30-150MHz
3dB Band Width	MHz min. _____	32% - 35%
30dB Band Width	MHz max. _____	
Insertion Loss	dB max. _____	
Amplitude Ripple	dB max. trans. _____ MHz	
Spurious Response	dB max. to _____ MHz	
Group Delay Time Variation	ns _____	

# KAF - TV/VCR Series SAW Filters

## MHz Video Sound Intermediate Frequency SAW Filters

### Features:

- 1) Adjustment free
- 2) Replaces more than ten components to do the same function
- 3) Excellent temperature characteristics
- 4) High reliability
- 5) Hermetically Sealed Metal Case

### How To Order:

**KAF - 45 ZR - MQ**

(1)      (2)      (3)

- ① Model (Kyocera Acoustic Filter)
- ② Frequency
- ③ Type number

### Dimensions:

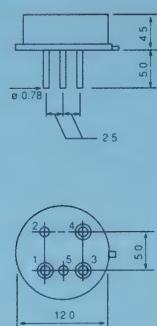


Fig. A

### Test Circuit:

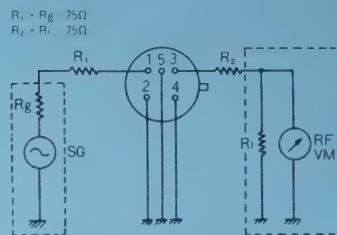


Fig. B

### Dimensions:

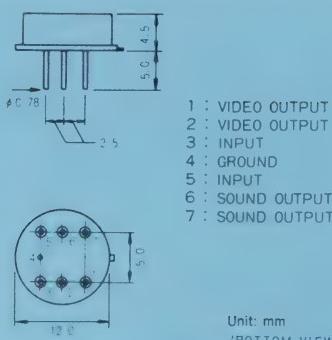


Fig. C

### Test Circuit:

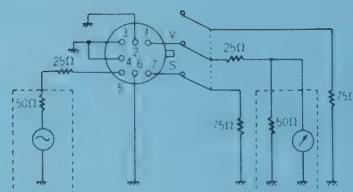


Fig. D

# KAF - TV/VCR Series SAW Filters

## MHz Video / Sound Intermediate Frequency SAW Filters

### Specifications (TV -VCR) - Video Intermediate Frequencies

Part No.		Insertion Loss (dB)	Attenuation level (dB)					Spurious Response (dB)	Impedance				Impedance Measuring Frequency (MHz)	Temp. Coef. of Frequency (ppm/°C)	Dimension	Test Circuit
			Associate Picture Carrier	Associate Color Carrier	Associate Sound Carrier	Adjacent Picture Carrier	Adjacent Sound Carrier		Input Resistance (Ω)	Input Capacitance (pF)	Output Resistance (Ω)	Output Capacitance (pF)				
T	KAF-58 MR-MM	26 max.	4.0±1.5	4.0±2.0	20.0±3.0	40 min. - 40 min.	30 min. - 28 min. - 27 min. - 30 min. - 28 min. - 25 min. - 28 min.	850	22	630	11	57.0	50 max.	Fig. A	Fig. B	
	KAF-45 ZR-MQ	29 max.	3.9±1.5	3.7±2.0	18.0±3.0			1570	20	1260	10	44.0				
	KAF-39.5MR-MM	31 max.	3.6±1.5	3.7±2.0	17.3±3.0			750	50	2200	10	36.5				
	KAF-38.9ZR-MJ	31 max.	3.3±1.5	4.0±2.0	17.0±3.0			600	60	1700	12	36.0				
	KAF-38.0MR-MH	32 max.	4.3±1.5	4.1±2.0	17.5±3.0			640	63	1920	11	35.0				
	KAF-37.0MR-ME	33 max.	5.0±1.5	4.0±2.0	10.0±3.0			1120	44	2330	11	34.0				
	KAF-36.9MR-MN	32 max.	3.3±1.5	3.9±2.0	18.0±3.0			750	50	2300	10	34.5				
	KAF-32.7MR-ME	33 max.	3.0±1.5	3.0±2.0	30 min.			540	65	1630	13	35.0				
	KAF-58 MR-MK	27 max.	4.0±1.5	—	14.5±3.0			380	45	1090	10	57.0				
	KAF-45 ZR-MP	31 max.	4.0±1.5	—	13.5±3.0			1540	19	1620	10	44.0				
T	KAF-39.5MR-MD	33 max.	3.0±1.5	—	17.0±3.0	35 min. - 35 min. - 25 min.	900 - 670	46	2000	12	37.0	50 max.	Fig. A	Fig. B		
	KAF-38.9MR-MP	30 max.	4.5±1.5	—	13.0±3.0			670	58	1700	12	36.0				
	KAF-38.9MR-MK	28 max.	2.0±1.5	—	13.0±3.0 (33.4MHz)			900	54	1950	12	36.0				
	KAF-38.0MR-MF	35 max.	4.0±1.5	—	8.0±3.0			660	42	2080	12	35.0				
	KAF-37.0MR-MD	36 max.	3.0±1.5	—	8.5±3.0			930	36	2100	13	34.0				
	KAF-36.9MR-MC	33 max.	4.5±1.5	—	13.5±3.0			690	48	2060	11	34.5				

### Specifications (Hi-Fi TV-VCR) Video Intermediate Frequencies

Part No.		Insertion Loss (dB)	Attenuation Level (dB)					Spurious Response (dB)	Impedance				Impedance Measuring Frequency (MHz)	Temp. Coef. of Frequency (ppm/°C)	Dimension	Test Circuit
			Associate Picture Carrier	Associate Color Carrier	Associate Sound Carrier	Adjacent Picture Carrier	Adjacent Sound Carrier		Input Resistance (Ω)	Input Capacitance (pF)	Output Resistance (Ω)	Output Capacitance (pF)				
T	KAF-45MR-MW	30 max.	4.5±1.5	4.5±2.0	25 min.	30 min. - 35 min. - 30 min. - 30 min. - 25 min. - 35 min.	25 min. - 20 min. - 30 min. - 20 min. - 25 min. - 30 min.	790	39	960	12	44	50 max.	Fig. C	Fig. D	
	KAF-38.9MR-MU	32 max.	2.5±1.5	20 min.	0 to 2.0			1800	34	1320	16	36				
	KAF-38.9MR-MU	31 max.	5±1.5	4±2.0	30 min.			2660	10							
	KAF-37.0MR-MD	35 max.	1.5±1.5	18 min.	1.5±2.0			2030	28	1830	14	35				
	KAF-36.9MR-MC	36 max.	3±1.5	2±2.0	26 min.			530	12							
	KAF-36.9MR-MC	23 max.	35 min.	35 min.	0 to 1.5			690	48	2060	11	34.5				
	KAF-38.9MR-MU	31 max.	5±1.5	4±2.0	30 min.			930	36	2100	13	34.0				
	KAF-38.9MR-MU	35 max.	1.5±1.5	18 min.	1.5±2.0			660	42	2080	12	35.0				
	KAF-38.9MR-MU	33 max.	4.5±1.5	4.5±2.0	25 min.			750	50	1700	12	36.0				
	KAF-38.9MR-MU	30 max.	3±1.5	2±2.0	26 min.			690	48	2060	11	34.5				

### Specifications (Hi-Fi TV - VCR) Sound Intermediate Frequencies

Part No.		Insertion Loss (dB)	Attenuation Level (dB)				Spurious Response (dB)	Temp. Coef. of Frequency (ppm/°C)		Dimension	Test Circuit
			Associate Picture Carrier	Associate Picture Carrier	Associate Sound Carrier	Adjacent Sound Carrier		Input Resistance (Ω)	Output Resistance (Ω)		
KAF-54 PR-MA	18 max.	1±1.5	35 min.	35 min.	30 min.	27 min.	27 min.	50 max.	Fig. A	Fig. B	
KAF-41 MR-MA	20 max.	0±1.5					30 min.				
KAF-39.2MR-MA	19 max.	0±1.5					30 min.				

# KAF - Direct Broadcasting Series SAW Filters

## Broadcasting system tuner, CATV converter SAW Filter

### Features

- 1) Compact
- 2) Adjustment free
- 3) High reliability

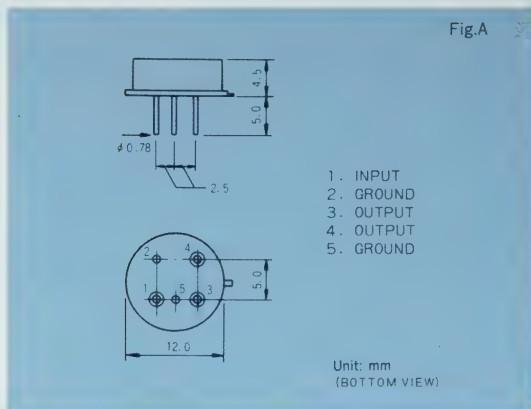
### How To Order

**KAF - 134 NR - MB**

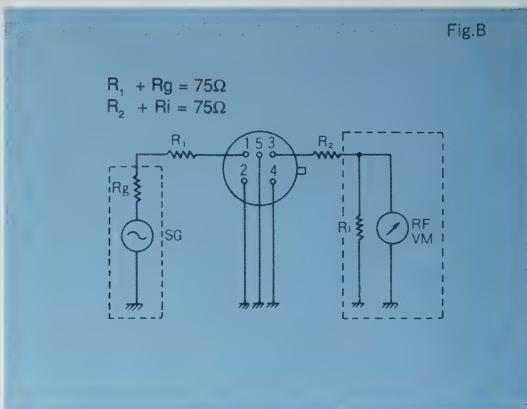
(1) (2) (3)

- ① Model (Kyocera Acoustic Filter)
- ② Frequency
- ③ Type number

### Dimensions:



### Test Circuit:



### Specifications

Part No.	Insertion Loss (dB)	Center Frequency (MHz)	Band Width at 3dB (MHz)	Band Width at 30dB (MHz)	Pass Band Ripple (dB)	Group Delay Ripple (nsec)	Spurious Response (dB)	Temp. Coef. of Frequency (PPm/°C)	Dimension	Test Circuit			
KAF-134NR-MB	25 max.	134.26	26 min.	50 max									
KAF-130NR-MA	22 max.	130	22 min.	45 max.	1.0 max.	$\pm 10$	35 min. (30 to 200MHz)	-80 max	Fig. A	Fig. B			
KAF-130NR-MB	21 max.		26 min.	50 max.									
KAF-70NR-WC	32 max.	70	23 min.	30 max.		$\pm 20$	30 min. (10 to 100MHz)						
KAF-70NR-WD	33 max.	70	25 min.	34 max.									

# KAF - Cordless Phones Series SAW Filters

## 46 and 49 MHz - Low Insertion Loss SAW Filters

### Features

- 1) Adjustment free
- 2) High reliability
- 3) Low insertion loss

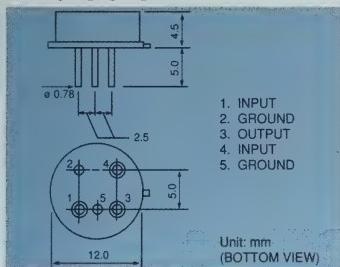
### How To Order

**KAF - 46 NR-ME**

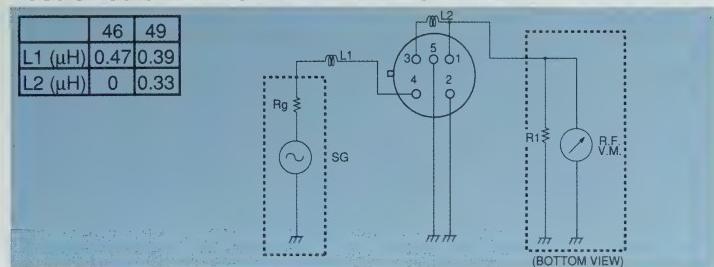
(1) (2) (3)

- ① Model (Kyocera Acoustic Filter)
- ② Frequency
- ③ Type number

### Dimensions



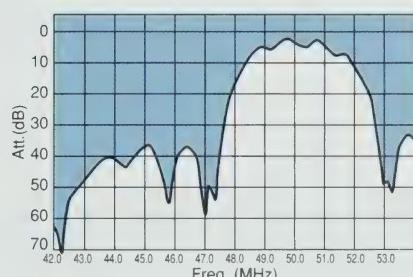
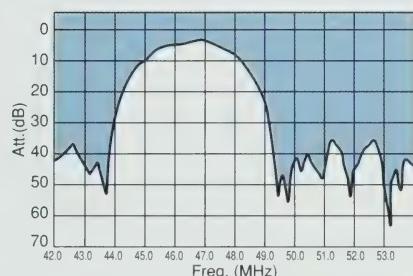
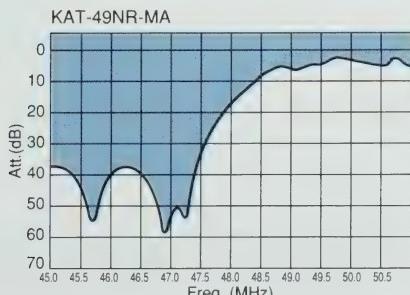
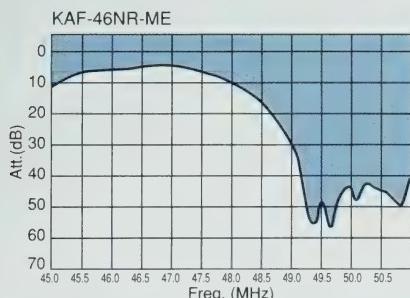
### Test Circuit KAF-46NR-ME/KAF-49NR-MA



### Specifications

Part No.	Insertion Loss	Attenuation (46.61 ~ 46.97MHz)	Attenuation (49.67 ~ 49.99MHz)
KAF-46NR-ME	3.0 dB max.	6.0 dB max.	30 dB min.
KAF-49NR-MA		30 dB min.	6.0 dB max.

### Characteristics



# KAF - CATV Converter Series SAW Filters

## RF Output SAW Filters

### Features

- 1) Two channels (3 and 4) built in  
(KAF-61MN-MA only)
- 2) Single channel 3  
(KAF-61MR-MB)

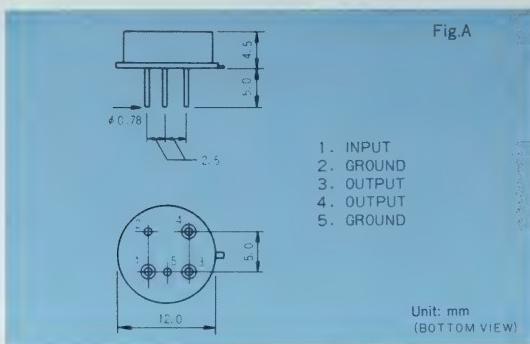
### How To Order:

**KAF - 61 MN - MA**

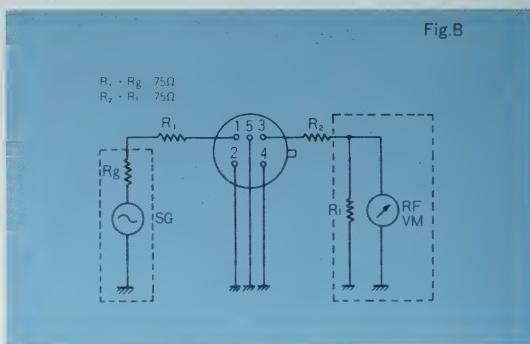
①      ②      ③

- ① Model (Kyocera Acoustic Filter)
- ② Frequency
- ③ Type number

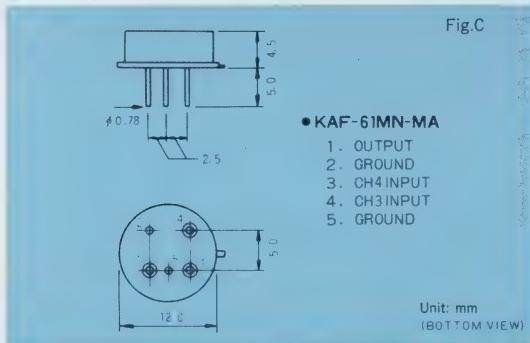
### Dimensions:



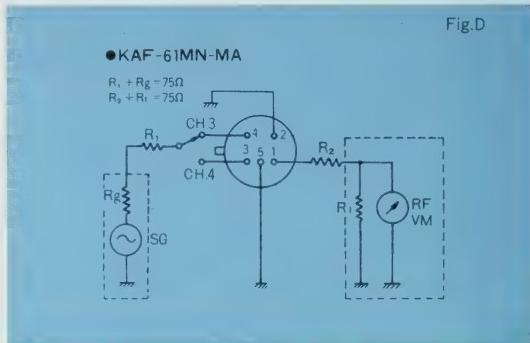
### Test Circuit:



### Dimensions:



### Test Circuit:



### Specifications

Part No.	Channel	Insertion Loss (dB)	Attenuation Level (dB)			Spurious Response (dB)		Temp. Coef. of Frequency (ppm/°C)	Dimension	Test Circuit
			Picture Carrier (fp)	fp+3.5MHz Reference at fp	fp+4.5MHz Reference at fp	fp+9MHz to 100MHz	fp-3.5MHz or below			
KAF-61MN-MA	3ch	27 max.	61.25MHz	-1±3 (64.75MHz)	-1±3 (65.75MHz)	20 min.	20 min.	50 max. (-10 to +80 °C)	Fig. C	Fig. D
	4ch		67.25MHz	-1±3 (70.75MHz)	-1±3 (71.75MHz)					

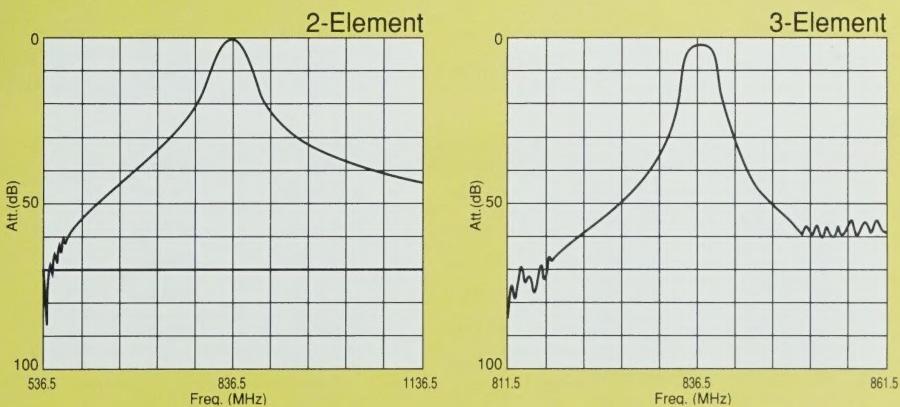
Part No.	Channel	Insertion Loss (dB)	Attenuation Level (dB)		Spurious Response (dB)		Temp. Coef. of Frequency (ppm/°C)	Dimension	Test Circuit
			Picture Carrier	Sound Carrier	Reference	25 min.			
KAF-61MR-MB	3ch	26 max.	1±2	1±3	25 min.	25 min.	50 max.	Fig. A	Fig. B

# AVX/KYOCERA Dielectric Filters

## General Description

Dielectric Filters are high frequency bandpass filters in the range of 800 MHz to over 1 Ghz. Their small size, low loss and good temperature stability make them ideal for the cordless and cellular telephone market.

Their construction consists of capacitive coupled "tuned" ceramic cavities using coaxial connections. This allows elements to be stacked together for different passband configurations. The ceramic material is a very high Q formulation for minimum loss characteristics. Typical passband characteristics for 2 and 3 element dielectric filters are shown in Figures 1 and 2.

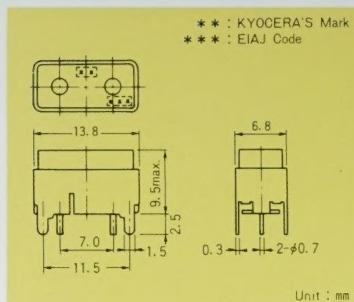


# KDF - Series Dielectric Filters

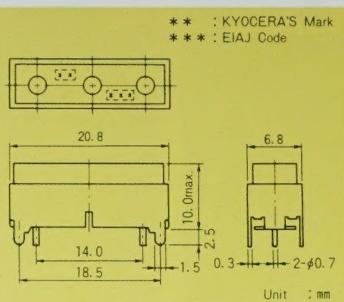
## Features

- 1) Compact, with low insertion loss using high Q ceramics
- 2) Various pass band widths available
- 3) High stability and reliability

## Dimensions: (2 element)



## (3 element)



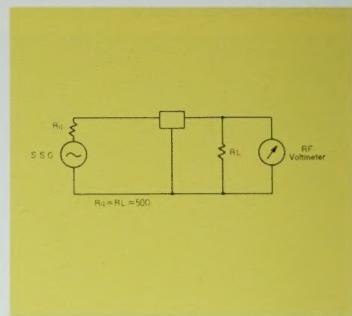
## How To Order

**KDF - 914 P 02 A**

① ② ③ ④ ⑤

- ① Model (Kyocera Dielectric Filter)
- ② Center frequency
- ③ Number of elements (P: 2-element, R: 3-element)
- ④ Pass band width
- ⑤ Type number

## Test Circuit:



## Specifications

### • KDF-R Series

Applications	Part No.	Center Frequency (fn)	Insertion Loss in passband(dB)	Passband Width (MHz)	V.S.W.R. in passband	Attenuation (dB)
E-AMPS	KDF-836R25A	836.5MHz	3.0 Max.	±12.5 Min.	2.0 Max.	12dB min. at fn=32.5MHz
	KDF-881R25A	881.5MHz				5dB min. at fn=28.5MHz
E-TACS	KDF-889R33A	888.5MHz	3.0 Max.	±16.5 Min.	2.0 Max.	12dB min. at fn=32.5MHz
	KDF-933R33A	933.5MHz				20dB min. at fn=41.5MHz
NMT900	KDF-902R25A	902.5MHz	3.0 Max.	±12.5 Min.	2.0 Max.	12dB min. at fn=32.5MHz
	KDF-947P25A	947.5MHz				20dB min. at fn=45MHz
N-TACS	KDF-911R27A	911.5MHz	3.0 Max.	±13.5 Min.	2.0 Max.	12dB min. at fn=32.5MHz
	KDF-856R27A	856.5MHz				20dB min. at fn=45MHz
NTT	KDF-927P25A	927.5MHz	3.0 Max.	±12.5 Min.	2.0 Max.	12dB min. at fn=32.5MHz
	KDF-872R25A	872.5MHz				20dB min. at fn=45MHz
Euro Cordless Telephone	KDF-959R02A	959.5MHz	4.0 Max.	± 1.0 Min.	2.0 Max.	45dB min. at fn=45MHz
	KDF-914R02A	914.5MHz				45dB min. at fn=45MHz
	KDF-931R02A	931.0MHz	4.0 Max.	± 1.0 Min.	2.0 Max.	45dB min. at fn=45MHz
	KDF-886R02A	886.0MHz				47dB min. at fn=45MHz
MCA	KDF-847R26A	847.0MHz	3.0 Max.	±13.0 Min	2.0 Max.	47dB min. at fn=97MHz

### • KDF-P Series

Applications	Part No.	Center Frequency (fn)	Insertion Loss in passband(dB)	Passband Width (MHz)	V.S.W.R. in passband	Attenuation (dB)
E-AMPS	KDF-836P25A	836.5MHz	2.8 Max.	±12.5 Min.	2.5 Max.	7dB min. at fn=32.5MHz
	KDF-881P25A	881.5MHz				24dB min. at fn=45MHz
NMT900	KDF-902P25A	902.5MHz	2.8 Max.	±12.5 Min.	2.5 Max.	7dB min. at fn=32.5MHz
	KDF-947P25A	947.5MHz				24dB min. at fn=45MHz
N-TACS	KDF-911P27A	911.5MHz	2.8 Max.	±13.5 Min.	2.5 Max.	10dB min. at fn=41.5MHz
	KDF-856P27A	856.5MHz				24dB min. at fn=45MHz
NTT	KDF-927P25A	927.5MHz	2.8 Max.	±12.5 Min.	2.5 Max.	10dB min. at fn=42.5MHz
	KDF-872P25A	872.5MHz				24dB min. at fn=45MHz
Euro Cordless Telephone	KDF-959P02A	959.5MHz	3.0 Max.	± 1.0 Min.	2.0 Max.	24dB min. at fn=45MHz
	KDF-914P02A	914.5MHz				24dB min. at fn=45MHz
	KDF-931P02A	931.0MHz	3.0 Max.	± 1.0 Min.	2.0 Max.	24dB min. at fn=45MHz
	KDF-886P02A	886.0MHz				26dB min. at fn=45MHz
GPS	KDF-1575P20A	1575.0MHz	2.0 Max.	±10.0 Min.	2.0 Max.	7dB min. at fn=35MHz
MCA	KDF-847PS26A	847.0MHz	2.8 Max.	±13.0 Min	2.5 Max.	26dB min. at fn=97MHz





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